

ABSTRACT

A process and apparatus for injecting fluids through needles at controlled mass flow rates into permeable solids such as meat or fish. This invention utilizes a multiplicity of needles, each having a flow control orifice that is sized to non-mechanically control the mass flow of fluid through the orifice. When fluid at a fixed pressure is applied to the inlet of each orifice, fluid mass flow through each needle remains constant with increases in backpressure until the backpressure reaches approximately one-half of the inlet pressure. The rate of fluid mass flow through a needle is calibrated to discharge a particular fluid volume at a particular inlet pressure and backpressure. When the needles are inserted into a permeable solid having regions of varying densities, resistances or permeability, the change in rate of fluid mass flow is minimized over such regions to cause even distribution of fluid throughout the permeable solid.